# COLORADO CONSERVANCY

# FOREWORD

This bulletin will be a regular visitor to you each month. Within these pages we will record our mutual progress in the war we are waging against our greatest enemy -- Erosion.

We shall publish in this booklet articles that outline our plans of attack and by this method transmit to our battle lines valuable plans which we must use to defeat the erosion menace.

Our productive soils must be maintained that we may insure our future agricultural security. The Soil Conservation Service does not possess magic by which our barren pastures and fields swept by wind and cut by water may be overnight transformed back to their former value, but the SCS has mobilized every available and valuable factor of science, equipment, and manpower to fight side by side with the farmer in this realistic war against erosion.

Our division of attack in Colorado constitutes just a part of the nation-wide war to defeat erosion. Our defenses will require the complete cooperation of every farmer and governmental agency, that we may drive from our lands the enemy erosion.

-- The Editor.

COLORADO CONSERVANCY

Project No. 39 Colorado Springs, Colorado

A. E. McClymonds - Regional Director

Editor - J. S. Young Contributors - SCS Staff

September, 1935

## THE REGIONAL DIRECTOR SPEAKS

In nature there is a balance established between Soil, Slope, Vegetation and Climate. Regions of heavy rainfall are heavily covered with vegetation. Steep hillsides are covered with forests and plains regions are covered with grass. When man enters in, he destroys this balance.

Previous to the last few years, this unbalanced condition was being carried on and we thought nothing of it. This was due partly because we were doing our farming on reserve food supplies stored up in centuries past. These food supplies and rich humus deposits stored in our top soil became depleted by clean cultivation practices. Drainage by torrential rains became so serious that it was noticeable. The soils commenced to blow in damaging proportions where before no great damage occurred.

Due to dreuth and our methods of farming, we were losing 50 per cent of the moisture that fell on the ground.

Where man destroys this balance in nature, man must make provisions to assist in the restoration of the balance.

The Soil Conservation Service came into being in 1933 to assist and work with the farmers in trying to restore the balance of nature by all known methods. Terracing, contour cultivation and numerous small water conservation dams will be built to cut down the damaging effect of floods and allow the moisture more time to get into the soil.

Certain areas that should never have been broken out are so badly damaged by erosion already that only getting them back into grass will save them.

Range management practices will be one of the big problems the Colorado projects will have to face -- contour terracing of our range lands so the penetration of moisture will be greater. In other words, we will, by mechanical and vegetative means, try to make the water walk instead of run down our slopes.

In all of our means of control, we want the complete cooperation of the farmer, for, in the end, it is his farm and his home. If we all can work together, each of us realizing the others' problems, we will establish a new and better agriculture in our project areas, and from these project areas the methods can be spread to similar conditions over the state.

A. E. McClymonds
Regional Director

-- SCS --

## Harvesting Native Grass Seed

"Back to grass" is the battle cry of the dry-land farmers in eastern Colorado today.

How to revegetate, and with what grasses, is the problem the Agronomy Department of the Soil Conservation Service is out to solve.

Very few of our cultivated grasses are adapted to eastern Colorado conditions, even when given special attention and a favorable location.

Native grasses have, by many years of natural selection, become adapted to the severe climatic conditions of the eastern Colorado plains. It seems, therefore, almost imperative that we use these native grasses in our revegetative work.

Since no domestic seed supply of these native grasses is available, plans were made to harvest the seed from the better native stands which are found scattered throughout eastern Colorado and southeastern Wyoming.

The first step was to spot good, pure stands of grass which had prospects of producing a good seed crop. It was necessary that these fields be fairly large in size and free from weeds, since we expected to use mechanical strippers for harvesting.

Two strippers were started on the L. E. Vick ranch, located nine miles southeast of Hugo, Colorado on Highway 40 South. This field was about 150 acres in size and was well covered with grass. This grass, which is known as Sporobolus airoides, or red top, has a wide range of adaptation. It is usually found on rather heavy alkaline soils. It makes fair forage and is a good seeder.

A few days later another machine was started on the J. F. Compton ranch, harvesting the same kind of grass. We also were able to harvest a few sacks of blue grama seed on the same farm.

A very good fie ld of Hilaria jamesii, white grass, was located on the Milburn farm about 60 miles south of Hugo. Arrangements were made with Mr. Milburn for harvesting the seed, and a machine was brought in from Colorado Springs the next day. The seed was dead ripe and had started to shatter. Two days later a heavy wind came up and blew off all the remaining seed. We harvested 30 sacks of seed from this field before the wind stopped us. This grass is found on heavy clay soils, and is very drought resistant. It spreads by underground rootstocks and also by seed.

The Woolridge ranch, located one mile north of Hugo, was our next stop. A little over a day was spent here harvesting Hilaria jamesii.

From the Woolridge ranch we moved to the E. C. Ewy ranch near Limon. Mr. Ewy had a very excellent 50 acre field of blue grama grass. We were able to harvest 115 sacks of seed in five days from this field. Bouteloua gracilis, or blue grama, is one of the dominant grasses of the short-grass prairie, and an excellent forage grass.

Four machines were taken to Grover, Colorado, to harvest several good fields of red top (Sporobolus airoides), Indian ricegrass (Oryzopsis hymenoides), and Sporobolus cryptandrus.

Another machine was moved to the Dupke ranch near Castle Rock where a 30-acre field of Aristida longiseta was harvested. This grass is worthless as a forage grass, but has possibilities as a soil binder on badly blown fields.

Our next move was from the Dupke ranch to the Winkler ranch, where we are now harvesting Agropyron smithii. This grass has excellent soil binding qualities and is a very good forage and hay grass. It is anticipated that this grass will be used very extensively in our erosion control work.

As the seed was harvested, it was loaded into a truck and taken to Colorado Springs for rethreshing and cleaning.

All seed lots were given a number, and a germination test will be run on each lot after it is cleaned.

It is expected that many of the species will run high in hard seed content and, therefore, be low in germination. If this should be the case, some method of scarification will have to be worked out for increasing the germination on these lots.

Various mixtures, which will include several of the native grasses harvested, will be planted on the various projects next spring. Also, several methods of planting will be tried out.

J. H. Christ
Chief Agronomist

TO DEFEAT THE EROSION MENACE

Strip crop; contour farm; defer and rotate grazing; plant trees, shrubs and vines; control gullies before they control the farm; blank list on contour to prevent blowing; contour furrow pasture lands -- these are but a few ways that erosion can be checked and a helping hand offered Mother Nature that we may help ourselves.

# IT'S TIME TO TAKE AN INVENTORY

Increasingly large stretches of once fertile lands being stripped of their life-giving humus; rivers breaking further into floods of increasing severity as denuded slopes permit an ever swifter run-off; industry and agriculture becoming ever more precarious; and the life of the people becoming more and more disorganized. Such is the dark picture painted by the Mississippi Valley Committee, if certain present day trends are to be projected unaltered into the future.

During the summer and fall of 1934, this Committee, made up of a group of leading American engineers, completed a comprehensive survey of the entire Mississippi drainage, of which Colorado east of the Rocky Mountains is a part. In their report submitted to the United States Government, they state that the direct losses from soil erosion in the Mississippi drainage are estimated to be not less than 400 million dollars annually. The indirect social and economic losses cannot be measured in money values. The fact of special significance is that impairment of our soils, such as is now taking place, is permanent in character.

The Soil Conservation Service, established by an Act of Congress, is here to cooperate with the landowner and tenant in preventing the fulfillment of that black prophesy. The initial requirement toward solution is a thorough knowledge of the individual problem as it exists on each farm. In order to secure this information, it is necessary first to take an inventory of the farm's only permanent resource, the soil itself - in other words, the making of a detailed soil erosion survey.

For this purpose, thoroughly trained men are sent into the field. An accurate large-scale map of each farm is prepared. Upon this map is shown every change in type of soil; whether or not the

soil is rich or poor, light or heavy, shallow or deep, and whether it will blow or wash as the case may be. A knowledge of steepness of slope is imperative both in erosion control and in successful farming. Slope grades are measured and outlined upon the soil erosion map. The present use which is being made of the land is indicated; in other words, whether it is planted to crops, pastured, permitted to produce forests, or is abandoned. The degree of soil loss by erosion and whether this loss is occasioned by wind or water is carefully determined and accurately recorded.

With this information as a basis, the Soil Conservation Service is enabled to cooperate with the landowner and tenant in the preparation of an intelligent, long-time program of soil saving and land use. Such a program, when developed and practiced on a universal scale, must necessarily insure individual security to American farmers and long continued prosperity for a great nation.

J. N. Spencer
Soils Expert.

## GARAGE

One of the busiest spots in the state of Colorado is our garage under the able direction of Mr. Charles Craig. Mr. Craig and his staff have a great deal of work and responsibility in caring for all of the regular project and camp equipment.

At the present time we are operating thirty-eight truck and automobile units, three Diesel 50 tractors, five seed strippers, four cultivators, two graders and two subsoilers, in addition to the camp units which are brought in for periodic inspection. There are prospects that the number of truck and automobile units will be more than tripled in the near future. The lubrication, repair and checking of this equipment are vital factors in the success of our work.

## ENGINEERING ON THE BLACK SQUIRREL CREEK PROJECT

The engineering part of the Erosion Control Program includes the building of structures to help hold the rain on the land where it falls, and this results in flood control, increased pasture vegetation, and raising of the water table by the filtration of the moisture through the soil.

On the Vollmer Ranch, contour furrows built in the Black Forest area held approximately an inch and a half rain in good shape, and no run-off was noted, and thinning out of the forest will give the grass a much better chance.

Mr. Ayer, also in the Black Squirrel Creek area, has supplied the materials for the stream bank protection adjacent to his house, and a dike is being constructed using rails, wire and rock. Mr. Ayer also is supplying the cement for a rubble masonry spillway for a dam northwest of his house. Incidentally, this dam had formed a pond which was stocked with trout and bass for 40 years until the Decoration Day flood, when the dam was filled half full of silt and debris, and the pond is now dry. Other work in this area includes the construction of diversion ditches, check dams in gullies, and earth dams for both flood control and stock watering purposes.

Nearly all of the ranches are now signed up along the divide, and work will be carried on from the top of the drainage down through the project, in an effort to stop the rainfall in its tracks on the slopes and in the gullies and stream beds. The successful control of the upper part of the drainage means that it will then be possible to do practical and helpful work on the farms lower down on the Black Squirrel Creek at a greatly decreased cost.

By September 20, approximately 625 men will be at work on this project. Two units of tractor equipment are also being used. All of the contour furrows in the forest area proper must be constructed by hand, as the trees prohibit the use of equipment.

On the Ayer ranch, a subsoil breaking machine was used between the contours in a small area as an experiment. This machine opens up a crack in the soil, but does not throw out a furrow, and this will increase the absorption of moisture between the furrows by a large percentage.

The spacing of the contour furrows will be determined by soil types, and somewhat by the pasture condition and future land use. A year or two of grazing control, which will permit grass to grow on the various engineering structures, will mean a much more satisfactory program, and a large decrease in the maintenance work on the structures.

Water spreading dikes of earth design will form an important part of the engineering work. These structures will not only slow up the run-off, but will spread the water over areas of grass which will benefit tremendously from the increased moisture. Whenever water is spread out into thin sheets, erosion is cut to a minimum, and a great deal more of the rainfall is absorbed for plant consumption.

E. R. Kinnear
Chief Engineer

-- SCS --

SAVE THE TOP SOIL AND SAVE THE FARM.

## FIFTY YEARS WASTE

Restoring the use of ranges, which have been mismanaged and overgrazed for the past fifty years, is the problem confronting the Range Management Department of the Soil Conservation Service at Colorado Springs, Colorado.

Were it possible to rest these ranges entirely for a period of years, the problem would be comparatively simple; but, when it is necessary to continue to use these ranges with a sufficient volume of livestock so that producers will have an economical unit of operation, the problem immediately becomes more complex and diversified. Likewise, if all of the range management programs could be adapted to and carried out on large, well-watered acreages, it could then be carried through to its logical conclusion with little difficulty. Under these conditions, it is possible to rotate as well as rest pastures, thus materially assisting and fostering the natural reseeding of the ground.

When one begins to consider, however, the problem of rehabilitating pasture land on farms of 40 to 320 acres, the picture changes. Operators of small tracts are usually unable to either lease additional land, or to entirely rest their own. Furthermore, they depend entirely upon what that land will produce in the way of crops and livestock for their living, and it is found that there is a minimum of livestock below which it is practically impossible to cut, no matter how badly the pasture needs to be rested. Many of these places are so denuded of vegetation that there is a run-off of water that falls on the ground of from 70 to 90 per cent. On these farms it is necessary to make contour furrows or other construction to get the water

into the ground when it falls. Vegetation, in all climates, is measured by the moisture available.

Livestock water is badly needed in nearly all of these places. Walking too far for water, tramps out grass and walks off fat. We find it necessary to build water holes for stock water.

The aim of this department is to carry out a constructive and practical management program which will adapt itself to the diversified conditions found in the various areas and projects in the state. To do this requires thorough and complete understanding of each operator's condition and circumstances as well as his future plans.

Too much emphasis cannot be placed upon the importance of the necessity of working out a conservative five-year livestock program which will be adaptable under normal market and weather conditions. If this is consistently and intelligently followed through, the results cannot help but be beneficial to all concerned.

O. E. McConnell
Chief, Range Management

-- SCS --

Visitors from Washington to the Colorado Projects include Dr. W. C. Lowdermilk, Associate Chief of the Service; Dr. Roy W. Kelly, Senior Administrative Officer; Lyman Carrier, Chief Agronomist; J. G. Lindley, Head of ECW Division; C. R. Ramser, In Charge of Watershed and Engineering Studies; A. S. Imirie, Administrative Officer in Charge of ECW Personnel; Ewing Jones, Administrative Asst. ECW; and Wilkie Collins, Jr., Assistant Agronomist of the Service.

# FORESTRY & SOIL CONSERVATION
## (Thinning Timber in the Black Forest)

Forestry must play a minor role in the control and prevention of erosion. There are places in which forestry is needed and care must be exercised to avoid getting a round peg in a square hole when these places are found. For the most part, forestry in the Colorado area will be limited to planting trees and shrubs. But, curiously enough, the main part of forestry work that has been done on the Black Squirrel Project has been the thinning of overcrowded stands of timber in the Black Forest.

The timber in the Black Forest is almost a pure stand of ponderosa pine. Due to a variety of conditions of soil and other factors, there is a considerable variation in the quality of the timber. On the better locations fairly rapid growth is obtained and the timber is usually healthy. In other cases growth is slow and the timber is seriously infected with mistletoe. Our objective in thinning the timber is to remove those trees which will eventually die because of overcrowding and thereby make all of the moisture and plant food available to the trees that are left. A comparison of the conditions of a stand of trees that have been thinned and a stand that has not will readily prove to one who is observing that the thinned timber is much more healthy and vigorous. Also, when a stand of timber is opened up by thinning, grasses and other vegetation are encouraged by the greater amount of sunlight. Consequently, a thinning properly carried out will improve the grazing value of the land.

Before any thinning is started, we must consider the purpose to which the owner of the land desires to put the timber. In some cases all the salable products have been removed and the immediate

job becomes one of putting a young stand in the best condition for rapid growth. In other cases there are many trees which will yield timber of value for saw logs, railroad ties, mine props, posts, fuel and other purposes. In such cases, the possibility of removing mature trees for market and leaving young trees must be considered. Also, if the owner has a ready market for a limited number of posts and mine props each year, it would be unwise to thin the timber to a spacing which would yield sawlogs and railroad ties. In such cases a stand of timber is only partially thinned, withthe expectation of completing the thinning later by removing such trees as will make fence posts and mine props. Some small tracts are held primarily for summer houses and the aesthetic value of the timber is greater than the economic value. Here we musttreat the area quite differently from a tract that must yield the owner some financial return. Each owner has his individual ideas, which must be considered before any plan of action is adopted.

In a later article the question of planting will be considered.

H. D. Potheram
Chief Forester

-- SCS --

## SPECIAL VISITOR

Regional Conservator Calkins visited the Colorado Projects recently. Mr. Calkins and Mr. McClymonds inspected the areas during a two day trip.

# RODENT CONTROL

In order to make the work in soil erosion control more effective, the Soil Conservation Service will undertake rodent control work in all CCC Camp areas.

Rodent control is a very important part in Soil Conservation and will be done at no expense to the land owner. The work will be done within a 20 mile radius of each camp and eradication of all types of rodents that are harmful to vegetation, control structures and farm lands will be undertaken.

This work will be done in cooperation with the Biological Survey for the purpose of obtaining the best of methods, materials and experienced men to make it successful.

Every precaution will be taken to prevent the poisoning of any livestock or property destruction to the land owner. All land owners must sign a cooperative agreement before this work will be started on any land, and in case of land being leased the lessee is required to sign an agreement also.

Work will progress in the camp areas just as rapidly as possible. All land under CCC camp project supervision will be treated first for exterminating these posts. Cooperation of the land owners will be helpful and greatly appreciated by the Soil Conservation Service.

The county agents will also take an important part in this line.

Lowell L. Addington
Rodent Control Supervisor

## EXHIBITS

To date the Extension Department has exhibited at five fairs and conventions. Our first display was shown in April at the annual Colorado Springs Boy Scout Jamboree. In June we prepared models for the International Convention of the Baptist Church at Colorado Springs. Our next showing was at the El Paso County Shriners Fair, Colorado Springs. During the month of August we prepared displays for the Colorado State Fair at Pueblo and the Arkansas Valley Fair at Rocky Ford. In addition to these Fairs, the Colorado Springs Chamber of Commerce featured a Soil Conservation Service exhibit for a period of two weeks during the month of May. We are booked for future displays at the Douglas County Fair in Castle Rock and the Byers County Fair at Byers.

In all of our exhibits we have prepared two contrasting models. One of these illustrates the effect of wind, water and faulty farming practices. The other shows the prosperity which it is possible for the farmer to attain by close cooperation with the Soil Conservation Service and their recommendations. The general features of this model have been forest management, contour-furrowed rotated pastures, terraces, terrace outlets, contoured cultivated crops, strip cropping, controlled gullies, dams, wild life conservation and rodent control. These models have been subjected to actual flood conditions by the use of water from an ordinary sprinkling can. Excellent erosion effects and gullies have been secured in this manner. In conjunction with these models we have featured photographs of actual erosion conditions in Colorado.

There has been no material cost in the construction of these exhibits. Natural materials such as sod, soil and sand have been obtained in this locality by our department. For contoured cultivated

crops we have used barley with very good success. This barley was sprouted in flats in a local greenhouse and then transferred to the model.

An estimated thirty-five thousand people have viewed our models. Innumerable questions have been answered in regard to the various methods of erosion control. Three thousand pamphlets on this subject were distributed at the Colorado State Fair. The public has displayed such keen interest in these exhibits that we cannot help but believe that they have been a big factor in creating erosion consciousness in Colorado.

M. H. Weaver
Extension Department

-- SCS --

PHOTOGRAPHY

The Photography Department has cooperated with all the other departments in securing photographs of the various projects. Repeat photography is being made after the completion of the work so that the different phases of the work can be better correlated and understood by our technical staff.

The Extension Department is showing moving pictures and slides at cooperative meetings and fairs. The public demand for these pictures indicates that the value of visual education in our Service cannot be stressed too highly.

A. W. Jarrett
Staff Photographer

## THE GREATEST THIEF

Not less than 126,000,000,000 pounds of plant-food material is removed from the fields and pastures of the United States every year. Most of this loss is from cultivated and abandoned fields and overgrazed pastures and ranges. The value of the plant-food elements (considering only phosphorus, potash, and nitrogen) in this waste, as estimated on the basis of the chemical analyses of 389 samples of surface soil collected throughout the United States, and selling prices of the cheapest forms of fertilizer material containing these plant nutrients, exceeds $2,000,000,000 annually. Of this amount, there is evidence to indicate that at least $200,000,000 can be charged up as tangible yearly loss to the farmers of the nation. These calculations do not take into account the losses of lime, magnesia and sulphur. --

H. H. Bennett in "Soil Erosion a National Menace", published in 1928.

-- SCS --

Editors Note:

As early as 1920 Mr. Bennett was actively concerned with the importance of erosion control. Today, as Chief of the Soil Conservation Service, Mr. Bennett heads the organization whose entire existence relates to the control of erosion and the maintenance of the fertility of the land, that our future agriculture may endure.

-- SCS --

## TEMPLETON GAP CAMP SCS-6-C

This camp, originally established under the Forestry Service, was transferred to the SCS April 1st, and some very good work has been accomplished. The Templeton Gap area has always been a serious flood menace to the northeastern part of Colorado Springs. The lives and property of many Colorado Springs residents would have been jeopardized during the flood of last May 30th had it not been for the flood control work already completed throughout this area. A contour furrowing program for the area is being saved for the winter months, when the severity of the weather will make it too difficult to handle the outlying projects. With the completion of the contouring program, in addition to the flood control work already done, it is believed that the Templeton Gap flood menace will be permanently removed.

The personnel of the camp includes Superintendent Moody, Engineer Girling and foreman Mock, Dolan, Thompson, Hutchinson, Gardner and Sears. Under their direction the boys are now working on the Pring and Lewis ranches. Since August 1st ninety miles of contour furrowing and twenty check dams have been completed.

-- SCS --

"If we are to win out against this accelerated waste (erosion), we have less than twenty years in which to develop the techniques, to recruit the fighting personnel, and most significant of all, to change the attitudes of millions of people who hold that ownership of land carries with it the right to mistreat and even destroy their land, regardless of the effect on the total national estate." --

Editorial in Atlanta Journal by Morris L. Cooke, Chariman Public Works, Mississippi Valley Committee.

The major problems of this area, consisting of some 75,000 acres of land, are the control of floods, grazing, and water conservation.

The general topography of the area is rolling to gently undulating terrain. It is a natural valley lying between bordering ridges with Kiowa Creek as the main drainage course. The slopes are gentle in the valley bottom and abrupt grades near the mesas.

Such topography, even in description, implies the necessity of erosion control, especially without the protection of adequate vegetative cover which this area noticeably lacks.

The thundering flood of May 30th swept through this valley destroying life and property as well as covering countless acres of fertile hay and irrigated pastures.

The Soil Conservation Service CCC camp enters into this area to carry on a program of erosion control by means of check dams, contour furrows, diversion ditches, stock water holes, and a cooperative grazing control program with the farmers.

The buildings are completed and as soon as the work company is supplied and conditioned, control work will begin immediately. Superintendent Prink and Engineer Quackenbush are at work making preliminary surveys and reports, laying the foundation of the actual work to follow.

SAVE THE SOIL

Proper Land Use Means
Soil Conservation

CONTOUR REMARKS
(On the level)

"The Colorado Springs Flood of that Memorial Day was a disaster that might have been prevented, had the Soil Conservation Program been in effect for a number of years." So spoke one of the leading farmers of the Monument Creek watershed.--The watershed on which the torrential downpour was loosed and damaged the beautiful city below.

Immediately following the flood, several members of the Service flew over this region that sent the raging waters into the city. Aerial pictures verified the beliefs of our expectations. Below us was a rolling, barren, erosion etched land. No vegetation of any sort. A land that for the two weeks prior to the flood had been thoroughly soaked by frequent rains. The saturation point had been reached although this soil was particularly porous but when deluged by an estimated seven inch cloudburst the whole area began to move toward Colorado Springs.

The destruction of this storm will never be forgotten. Loss of life, property, and land is irreparable. The damage to just highways alone has not been estimated in dollars and cents.

The "disaster that might have been prevented". How? That question stimulates the minds of not only the farm but city dwellers as well. The answer is being repeated in this article. By a program of range and farm management, terracing of cultivated fields, small but numerous conservation reservoirs, contour listing and cultivation, furrowing of pastures, etc. covering the entire drainage area above this city. This would reduce run-off from a fourth to a half in torrential rains and provide complete control in normal rain storms.

The soil conservationist must be familiar with the basic erosion-control plan. He must have a working knowledge of Soils, Agronomy, Engineering, Forestry and Range Management. He must study the land use plan and erosion-control methods employed by some of the farmers of the area; then determine what improvements could be made on the farms by the application of the basic erosion-control plan. Every farm presents a different problem and all possible means of erosion-control must be considered in developing a plan for the individual farm that will control erosion and at the same time permit the farmer to maintain his farm income.

The soil conservationist is not a super human being, however, so in order for him to function, it is necessary that he have the assistance of all other departments upon which he is dependent for such technical advice needed so he can best aid each farm cooperator.

This department contacts each farm cooperator and together a land use plan is worked out so that erosion can best be controlled and at the same time increase vegetation on the land ultimately to retain the soil and improve it so as to increase farm income. Contour furrowing, gully control rotation and control grazing are methods used on pasture land, while gully control, contour cultivation, terracing, strip cropping and crop rotations may be used on cultivated lands.

When the land use plan is agreed upon, it is then necessary to embody all plans in a five-year cooperative agreement, specifying what work is to be done and where it is to be done; stating clearly what materials, machinery and labor is to be fur-

nished by the two cooperative parties, the Government and the farmer.

At this point it is necessary to enlist the cooperation of all departments so as to formulate the most practical land use plan the best erosion-control practice, coordinating information and activities of all departments and the cooperator during the five years duration of the cooperative agreement.

It will be the duty of the Conservation department to contact the cooperator at certain intervals, to help change or amend plans if it seems to be necessary, to improve the erosion-control and land use plan. He will also be responsible to the cooperator in bringing to him specialists or technical information from them ffecting various phases of the plan.

It might be interesting to note the life history of a cooperative agreement. The first contact with the cooperator is made to explain the general erosion-control plan as it applies to his individual farm and the community, and enlist his cooperation. Following a soil erosion survey is made to serve as a basis for land use as it applies to Agronomy, Engineering and Forestry. The land use map is then prepared showing where work is to be done, crop rotations, cropping plans, reforestation, Range control, etc. These plans are then checked by the heads of departments and cooperator for his signature; then to the Regional Director for signature, after which copies are supplied to the cooperator, Regional Director and Washington D. C.

Ralph H. Musser
Chief Soil Conservationist

HUGO CAMP SCS-3-C

This area is composed mostly of range and pasture lands, which, on little or no provocation, send swirling floods down the drainage, Big Sandy Creek. Because of the soil types and lack of adequate vegetation to control such flooding, the work being done by this camp is very important.

Early in August the actual construction work in the field began. Under the supervision of Superintendent Cool, Engineer Major Grover and foremen Mahon, Warner, Huckins, E. T. Ryan, Compton and L. Ryan, the work has progressed in fine shape. Contour furrowing of these lands has been done on a big scale. Other work in the future calls for the building of numerous small conservation dams, water holes, diversion ditches and grazing control. It is felt that by a complete coverage of the project area together with entire Soil Conservation program of Farm Management, Forestry, etc. the area may be controlled to prevent floods which sweep the Big Sandy all the way to the Arkansas River.

The evident spirit of cooperation among the farmers and townspeople of Hugo is encouraging to the program of erosion control.

Landowners who have signified their intention to cooperate with the SCS in this area by signing the cooperative agreement or by application, include the following:

| | | |
|---|---|---|
| W. Utz | J. Fiala | W. F. Thomas |
| J. E. Wolverton | J. G. Denton | E. H. Wooldridge |
| Bert Milen | J. S. Bruch | F. M. Proffitt |
| A. B. Heimback | A. Kintzie | G. Antinopulis |
| Mrs. Zimmerman | H. D. Mitchell | Mr. Stramp |

and others.

## SOIL CONSERVATION ASSOCIATIONS

These Associations are voluntary organizations set up by the farmers and interested parties in certain geographic areas. These temporary associations are to function temporarily until permanent Soil Conservation Associations or Districts are organized under laws of this state as a public body, corporate and politic.

The purposes of the individual association consist of acquisition and dissemination of information relative to all factors of erosion by wind and water, to promote and encourage cooperation of all landowners, operators, farmers and non-resident owners within the area covered by the association. Also to encourage cooperation with all governmental agencies, Federal and State, in carrying out preventative measures and conducting demonstrational control projects, and when desirable to solicit Federal and State assistance in accomplishing such purposes.

The Association shall be directed by a board of five directors, three of whom must be owner-operators or tenant-operators.

At Kim, Colorado, such an Association has been organized. Mr. Church heads the Association as president. Directors Bishop, Crane, Allen and Secretary Payne complete the Association officers. County Agent Brown has been most helpful in the Association and work accomplished.

An Association is also being organized in Elbert. Articles of Association and by-laws are being adopted.

Regular Project and Camp

Our regular project area in this vicinity embraces 169,000 acres of grazing and cultivated land. Engineer Stambaugh of the Regional office has been directing the regular project program in this area and on the ninety-one acres controlled to date, fifteen miles of contour furrowing have been completed and in addition one hundred and five miles have been staked out for future contouring. Hand labor has been used and up to the present time only thirty-two laborers have been available. However, indications are that one hundred men will be working by October 1st. Work is now being done on the W. C. Shultz and Enos Plessinger properties. At present a Killifer chisel is being used on a forty acre field in this area. The chisel is being used between the contour furrows at a depth of twenty-six inches. A 50 HP tractor is doing the job at a cost of twenty-five cents per acre and results have already shown that the moisture penetration attained by contouring has been greatly increased by the chisel.

The personnel of SCS Camp 4-C in this area includes: Superintendent Fisher and foremen Crowfoot, Mitchell, Pilger, Romack, Thompson, Cahill, Meier and Synder. Some very good contouring has been done by the camp. A recent one-inch rain tested the work and everything held up well. Tests for moisture penetration showed moisture to a depth of twenty inches, while adjacent uncontrolled land showed a penetration of only three inches. In all camp areas where the contour furrowing program has been subjected to heavy rains, similar results have occurred.

-- SCS --

CONSERVATION SHOULD BE OUR FIRST LAW TO AID NATURE.

## UNCONTROLLED EROSION AND DESTRUCTION

Throughout the past sixty to seventy-five years, according to Dr. A. G. McCall of the United States Department of Agriculture, about 35,000,000 acres of the best farm lands have been permanently ruined by soil erosion. This is 10 per cent of the cultivated acres in the United States.

-- SCS --

According to H. H. Bennett, Chief of the Soil Conservation Service, soil erosion has robbed our fields each year of more than twenty times as much plant food as has been consumed by the crops grown.

-- SCS --

Three billion tons of soil material is washed from the fields of farmers in the United States each year, to say nothing of the countless tons lost by wind erosion.

-- SCS --

"An equivalent of a quarter of a million farms of about 160 acres each have been abandoned as a result of soil erosion. Seventy-five per cent of all cultivated land in the United States shows visible signs of erosion losses." - quoted from S. P. Lyle, Senior Agricultural Engineer, U.S.D.A. But erosion damage is not confined to fields. It destroys dams, bridges, highways and chokes streams and lakes.

-- SCS --

Forty tons of fertile soil per acre per year is not an uncommon loss from erosion on unterraced cultivated fields according to studies made by the Department of Agriculture.

# CCC IN THE PUEBLO OR BURNT MILL AREA

Actual work of erosion control began in the Pueblo area August 12. Under the direction of Superintendent Decker and Engineer McDonnall, rapid progress in control methods is underway. The interest of farmers in this district was evidenced at a meeting held August 7 in the camp through the courtesy of Lieutenant Kern. Some 200 interested farmers and business men attended this meeting.

The signing of some 6,300 acres of land under the cooperative agreement has taken place and at the present time work is progressing on the Bisbee, Shutts and Elliott farms.

Excellent tests of the contour furrows, diversion ditches and water holes were made during the torrential rains that fell in the area recently. Percolation tests prove that the land which had been contour furrowed received all the benefit of these rains and prevented the injurious flash runoff, while land not treated held little water and lost top soil.

Some 200 Oklahoma boys which constitute the CCC camp No. SCS-2-C (the Burnt Mill Camp), under foremen Price, Harris, Titman, Roper, Mortimer, and Keely take to their jobs with the utmost enthusiasm. Some 35 miles of contour furrows have been constructed, as well as a large number of check dams, water holes and diversion ditches. This work is of high quality. When submitted to the test of the cloudbursts mentioned above, they prove the strength of the work done by Superintendent Decker, Engineer McDonnall, and the foremen, to say nothing of the splendid work of the boys.

The Burnt Mill camp is particularly commendable from the standpoint of the farmers' interests and the type of work being done.

## TRINIDAD AREA

The land owners on the Frijole Project, better known as the Trinidad area, are at the head of the list as far as signed contracts go. Only two farmers remain to be signed, one of whom lives in California, and the other has been practicing Soil Conservation for 25 years and his farm needs very little of any Soil Conservation work.

Many farmers who do not benefit from the work of this camp are almost daily requesting the extension of the Soil Conservation Service to include their holdings, and they tell us they will go home and organize Soil Conservation Associations if they will be assured of work as soon as we get to them.

The land use under this project is mostly grazing and the grass that used to grow very abundantly has been overgrazed to the extent that little grass is now to be found. However, the advantage of restoring grass on this land is favorable because of the absence of stock in the vicinity. In fact, there has been no other time in the past fifty years when so few head of stock were owned by the ranch owners of the area.

The land conservancy work is being done by the Trinidad CCC camp under the direction of Superintendent Kane and Engineer Cresto. The conditions under which the work is being done are not too encouraging since there are very few years when there is enough rainfall. However, the landowners do not wish to abandon this land, and are quite content to stay and cooperate with the Soil Conservation Service in an earnest effort to reclaim this large area of grazing land.

The construction work is progressing rapidly. The boys are taking a keen interest in the work and are setting as their goal the completion of a section per week.

The effect of a completed farm and the benefits to the farm of Soil Conservation work is the topic of discussion in this area.

-- SCS --

WELLINGTON CAMP SCS-8-C

As we go to press, the new camp at Wellington in Larimer County is nearing completion. The complete personnel and enrollees have not as yet been secured. Control work will start upon an area consisting of 126,795 acres, 95 per cent of which is grazing land. This land is in bad shape and suffering from gully and sheet erosion. Some evidences of wind erosion are seen, particularly near the Wyoming line. The farm land in this area is suitable for the production of alfalfa, hay, corn and all small grains.

A suggested work program for the area includes grazing control, contouring, terracing, construction of check dams and water holes, reforestation and rodent control.

Methods of reseeding of overgrazed land, range land, terraces and old cultivated areas are being considered. Rodent control will be quite an item as prairie dogs and Wyoming gophers are quite numerous.

## DID YOU KNOW - THAT

Aerial photographs of the Black Squirrel Creek (El Paso County) and the Cheyenne County Smoky Hill River Projects have been made by aerial photographers from an altitude of 15,000 feet. These photographs are made into maps that show complete detail of the land, even to the smallest gully. They are essential to soil mapping and engineering field studies from which the Soil Erosion survey and land use maps are built.

They serve also as a pictorial record of these areas before work of the Service in erosion control was started, and will, at some distant date, be compared to the areas after completion of the Conservation program.

-- SCS --

## TOUR IS BEING CONTEMPLATED

A Special Tour October Third in the Castle Rock Camp Area

Arrangements are being made for all the farmers and business men of Douglas County to go over the area covered by the Soil Conservation Camp under the direction of Superintendent Henderson. Special arrangements for lunch in the Camp Mess Hall for the visitors will be made.

County Extension Agent Gunther is cooperating with our Extension Department to make this tour a complete success.

A trip to the Black Squirrel Creek area will finish the day's events.

SPRINGFIELD CAMP SCS-5-C

During the second week of August, actual field work by the company and technical staff began in the area. The Bear Creek Drainage is receiving the immediate attention of the camp.

Under the direction of Superintendent Beeler, Engineer Gleason and foremen Buzard, Stansbury, Edmonds, Gillespie, Herbert and Jacobson and some 180 CCC men, a contour furrowing program is progressing at the rate of five to six thousand linear feet per working day. The use of two tractors and disc plows with special adaptable improvements is resulting in a fine job of this furrowing work. During recent rains, approximated at one and one-half inches, the value of these furrows was clearly demonstrated. On land not treated, the penetration was only four inches, while the land that was contoured held all the rain and the soil was soaked to a depth of fourteen inches. Already the ultimate results sought for by the Service have been seen. The grass is once more greening up. This is an accepted fact that to permanently control wind erosion the vegetative cover offers the only permanent cure. This, in turn, requires the conservation of all rainfall which, because of lack of vegetation, dreuth and baked soils in this area, has been lost in flash run-off and floods.

Soil erosion surveys, base and land use maps have been made on the Randless, Ord, Graff and Seymour properties. Other properties will be surveyed as soon as possible. The work of this camp is most commendable in farmer cooperation and quality of work being done.

-- SCS --

## CASTLE ROCK CAMP SCS-7-C

This camp began actual field work on July 26, 1934 under the direction of the Forestry Service. On April 1st of this year, it was transferred by secretarial order to the Soil Conservation Service. Erosion control work has been done on the headwaters of several branches of Cherry Creek, thereby preventing floods and losses in the immediate vicinity, and in general the work has held millions of gallons of water out of the main branch of Cherry Creek, thereby aiding the city of Denver.

With the aid of contour furrowing to the accepted dam structures, which have been most successful, and diversion ditches, the Castle Rock camp is doing excellent control work. Under the supervision of Superintendent Henderson, Engineer Caldwell, and foremen Sobey, Fite, Johnson, Minkner, Scott, Watson and Wilson the CCC men are extending the work rapidly.

## SHOULD SOIL CONSERVATION BE TAUGHT IN COLORADO?

Some time ago Mr. H. H. Bennett, Director of SCS made the statement that not a single school or college in the United States offered a course in Soil Conservation. Many courses were offered pertaining to the different phases of erosion control such as Agronomy, Engineering and Forestry, but no single course or series of courses fully covering the subject has been available.

Recently, however, several schools in the United States have incorporated Soil Conservation courses in their curriculum and credit is given toward graduation. Many have suggested that the schools and colleges of Colorado might also offer courses in this significant subject.

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DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

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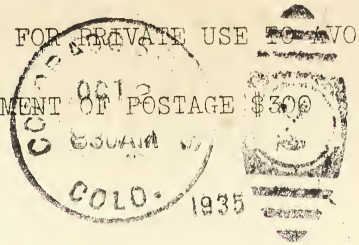


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